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ABSTRACT

The general purpose of this project (Title IV-C Pilot Program: An Educational Needs Projection Model) is to develop procedures for forecasting the personnel needed by the school district for a five-year period in response to current and expected legislation, changing student population, etc. During the first project year, 1976-77, emphasis is placed on forecasting the personnel needed for mandated bilingual education programs. This report summarizes the "Bilingual Education Cost Analysis," by Cardenas, Bernal and Kean (1976 a, 1976 b); presents a cost analysis of the Houston ISD bilingual education programs based on existing programs; presents initial estimates of personnel needs and costs for the Houston Independent School District; discusses the use of these estimates in an Educational Needs Projection Model; and includes two appendices, one comparing the Cardenas et al and the Alston bilingual education cost analyses, and the second on the ENP models. (Author/AM)

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TITLE IV-C PILOT PROGRAM: AN EDUCATIONAL NEEDS PROJECTION MODEL

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PROJECT REPORT

ESTIMATES OF PERSONNEL NEEDED AND COSTS OF HISD BILINGUAL EDUCATION PROGRAMS

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Prepared by

Herbert L. Alston*

March 4, 1977

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Estimates of Personnel Needed and Costs of HISD
Bilingual Education Programs

I. Introduction

The general purpose of this project (Title IV-C Pilot Program: An Educational Needs Projection Model) is to develop procedures for forecasting the personnel needed by the school district for a five-year period in response to current and expected legislation, changing student population, etc. During the first project year, 1976-77, emphasis is placed on forecasting the personnel needed for mandated bilingual education programs.

This report summarizes the Bilingual Education Cost Analysis by Cardenas, Bernal and Kean (1976 a, 1976 b); presents a cost analysis of the Houston ISD bilingual education programs based on existing programs; presents initial estimates of personnel needs and costs for the Houston ISD; discusses the use of these estimates in an Educational Needs Projection Model; and includes an appendix which compare the Cardenas et al and the Alston bilingual education cost analyses.

II. Cardenas et al. Bilingual Education Cost Analysis

Purpose

The Cardenas et al. study sought "... to determine the per pupil add-on costs of a minimally adequate bilingual program which would correspond to the regular monolingual program funded under the state's Foundation School Program ..." (Cardenas et al., 1976 b,) and to determine the "weighted pupil factors" for such a bilingual education program.[1]

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[1] The "weighted pupil factor" is the ratio of the per pupil cost of a student in a special program divided by the per pupil cost of a student in the regular education program. The weighted pupil approach of state financing is based on the fact that different students require different educational programs and that the cost of these programs will vary. The weighted pupil approach assigns a weight of 1.0 to the cost of a student in a regualr education program. Students who need special programs are assigned weights on the basis of the cost of the special program in relation to the cost of the special program. It is obvious that a bilingual education program will be more expensive than the regular educational program and will thus have a weight greater than 1.0

Methodology

The methodology for the Cardenas et al. study was to use the expert opinions of individuals involved in bilingual education to determine the characteristics of a minimally adequate bilingual education program, the resources needed for such a program, and the cost of those resources. Six resource areas were considered (staff, materials, equipment, testing, library needs, in-service training) for grades K through 5. In each category the experts were asked to consider only the extra resources needed, over and above those available from a regualr education program, to implement a bilingual education program. Weighted pupil ratios were calculated by dividing the cost of the regular education program per pupil, as funded by the Foundation School Program, and the extra per pupil cost of the bilingual program by the per pupil cost of the regular education program.

Staff

The amount of additional staff needed for a bilingual education program would depend on the number of bilingual teachers and support personnel the district already employed and the number of students to be served. The Cardenas study based personnel costs on "... the provision of additional staff funding equivalent to one-half the value of a classroom aide (Aide II) for units of students in bilingual program ADA (19 students in grades K-3; 21 students in grades 4-5) ... "(Cardenas, et al., 1976 b, p. 5). Note that no additional administrative or support personnel or teachers are included in these cost estimates for personnel to implement a bilingual education program. This is based on the implicit premise that bilingual education should be integrated in the regular education program and that a sufficient number of the regular education staff should be bilingual and have a knowledge of bilingual education.

Materials

Each expert gave their opinion of the cost of supplementary material, such as extra textbooks, that would be needed.

Equipment

"... only language masters (2 per classrooms in grades K-3; 1 per classroom in grades 4-5) were a necessary additional equipment cost..." (Cardenas, et. al., 1976 b, p. 6).

Testing

The cost of a screening test to identify students for further testing to determine if a student should be selected for a bilingual education program was not considered a cost that should be charged to the bilingual program. The costs of administering a language proficiency test on a pretest-posttest basis and the administration of an achievement test on a once-a-year basis were considered as part of the bilingual education costs.

Library Needs

"...panelists recommended a set number of books per pupil in bilingual education (7) which a school library should contain in addition to regular needs and that $9 per student per year be allocated for subsequent purchases..." (Cardenas, et al., 1976 b, p. 7).

In-Service Training

In-service training was considered a part of the regular education program and money needed for re-training rather than updating of skills was not considered a cost that should be charged to the bilingual education program.

Per pupil costs and bilingual education program weights

The per pupil costs estimated by the Cardenas et al. model for a four year period are reproduced in Table 1 and the bilingual education program weights are reproduced in Table 2.

TABLE I

CARDENAS ET AL. PER PUPIL COSTS

	Grade K				Grade 1				Grade 2			
YEAR OF IMPLEMENTATION	1	2	3	4	1	2	3	4	1	2	3	4
RESOURCE AREAS												
Staff	160.75	160.75	160.75	160.75	160.75	160.75	160.75	160.75	160.75	160.75	160.75	160.75
Materials	35.00	24.00	22.00	20.00	31.00	23.00	21.00	19.00	29.00	22.00	19.00	19.00
Equipment	20.54	6.85	6.85	6.84	20.54	6.85	6.85	6.84	20.54	6.85	6.85	6.84
Testing	2.48	1.32	1.32	1.32	2.67	1.51	1.51	1.51	2.78	1.62	1.62	1.62
Library	25.00	9.00	9.00	9.00	25.00	9.00	9.00	9.00	25.00	9.00	9.00	9.00
TOTAL PER PUPIL COST	243.77	201.92	199.92	197.91	239.96	201.11	199.11	197.10	238.07	200.22	197.22	197.21

	Grade 3				Grade 4				Grade 5			
	1	2	3	4	1	2	3	4	1	2	3	4
Staff	160.75	160.75	160.75	160.75	145.59	145.59	145.59	145.59	145.59	145.59	145.59	145.59
Materials	28.00	20.00	19.00	18.00	22.00	14.00	13.00	11.00	22.00	14.00	13.00	11.00
Equipment	20.54	6.85	6.85	6.84	10.27	3.43	3.42	3.42	10.27	3.43	3.42	3.42
Testing	2.79	1.63	1.63	1.63	2.83	1.67	1.67	1.67	2.91	1.75	1.75	1.75
Library	25.00	9.00	9.00	9.00	25.00	9.00	9.00	9.00	25.00	9.00	9.00	9.00
TOTAL PER PUPIL COST	237.08	198.23	197.23	196.22	205.69	173.69	172.68	170.68	205.77	173.77	172.76	170.76

TABLE 2

CARDENAS ET AL BILINGUAL PROGRAM WEIGHTS

(In multiples of monolingual program costs for each grade)

YEAR OF IMPLEMENTATION	GRADE LEVEL					
	K	1	2	3	4	5
1	1.31	1.42	1.41	1.41	1.36	1/36
2	1.25	1.35	1.35	1.35	1.30	1/30
3	1.25	1.35	1.35	1.35	1.30	1.30
4	1.25	1.34	1.34	1.34	1.30	1.30

III. Estimated Costs of HISD Bilingual Education Programs By Cardenas Cost Estimates

Methodology

The cost of a bilingual education program for HISD can be estimated by multiplying the per pupil costs times the number of limited-English-speaking-ability (LESA) students per grade level in HISD. An estimate of the number of LESA students per grade level in HISD in grades K-5 is presented in Table 3. Using the mean of the per pupil cost estimates of the Cardenas et al. Study (see Table 1), times the estimated number of LESA students per grade level, the costs for bilingual education programs in K through 5 would be $356,379 ; $446,671 ; $367,268 ; $253,016 ; $187,743 ; and $184,579 respectively. The total for 8871 students in K through 5 would be $1,795,656.

TABLE 3

ESTIMATED NUMBER OF LESA STUDENTS PER GRADE LEVEL AND
ESTIMATED COSTS OF BILINGUAL EDUCATION PROGRAM
BASED ON CARDENAS ET AL. COST ESTIMATES*

Grade	% LESA 1975-76	Student Population 1976-77	Estimated No. LESA	Cost Factor	Cost
K	10.9	15,491	1689	211.00	356,379.00
1	11.2	19,082	2137	209.00	446,671.00
2	10.4	16,978	1766	208.00	367,268.00
3	7.7	15,874	1222	207.00	253,016.00
4	6.6	15,716	1037	181.00	187,743.00
5	6.4	15,934	1020	181.00	184,579.00
			8871		1,795,656.00

*Note: The percentage of LESA students per grade level is based on a 1975-76 report to the Texas Education Agency by HISD. Costs are rounded to whole numbers.

Limitations of cost estimates

The assumptions on which the per pupil costs were estimated in the Cardenas et al. study should be kept in mind when considering the estimated cost of a minimally adequate bilingual education program in HISD. This is to say that these assumptions may not correspond closely with the actual resources needed for a mininimally adequate bilingual education program in HISD.[2]

IV. Estimated Costs of HISD Bilingual Education Programs from Costs of Existing Programs

Current state law

Current state law requires local school districts with 20 or more students of limited English speaking ability (LESA) in the same grade level to offer bilingual education programs in kindergarten through the third grade, and permits local school districts to continue these programs through the fifth grade for LESA students who are not able to progress satisfactorily in the regular education program (Education Code 21.453). The state reimburses local school districts for students enrolled in these programs at $45 per student. Twenty-five dollars per student is available for bilingual instruction and materials, and $20 per student is available for staff development and the development of curriculum materials from the Foundation School Program.

The required content and method of instruction for these programs is as follows: "(a) The bilingual education program established by a school district shall be full-time programs of instruction (1) in all subjects required by law or by the school district, which shall be given in the native language of the children of limited English-speaking ability who are enrolled in the program, and in the English language; (2) in the comprehension, speaking, reading, and writing of the English language; and (3) in the history and culture associated with the native language of the children of limited English-speaking ability who are enrolled in the program, and in the history and culture of the United States..." (Education Code 2.454).

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[2] This is not a criticism of the Cardenas et al. study. A large number of assumptions must be made in estimating the costs of any hypothetical program.

In brief, although state support is largely limited to kindergarten through the third grade, current state law requires a Transitional/Bilingual/Multicultural program for all LESA students in kindergarten through the fifth grade.

Strategy for determining costs

Bilingual education programs exist in the Houston ISD and information is available on the staffing and costs of these programs. These programs are not adequate to meet the standards of current legislation requiring a Transitional/Bilingual/ Multicultural program for all LESA students in K through 5. The additional resources needed to meet the standards of current legislation can be estimated. Given a description of the current personnel and resource costs, and estimates of the additional personnel and resources needed, estimates of the personnel and costs of providing a minimally adequate bilingual education program can be made.

Current HISD bilingual education programs

Bilingual education program 04

Bilingual education project 04 is a state and locally funded program with a total add-on cost of approximately $67 per pupil (HISD 1976-77 Proposed Budget.) It provides Spanish-monolingual and LESA students with Transitional Bilingual Education and English-as-a-Second-Language (ESL) programs for approximately 14,500 students, K through 12, in 95 schools. In addition a bilingual resource center funded by this project provides curricula and materials for the programs.

As can be seen in Table 4, project 04 authorizes the following personnel for the 1976-77 school year: 1 Bilingual Department Director, 3 Assistant Directors (1 for curriculum development, 1 for staff development, 1 for programs,) 1 Coordinator for ESL programs in the secondary schools, 1 Coordinator for ESL programs in the elementary schools, 1 Counselor, 1 Materials Specialist, 12 secondary school ESL teachers, 28 elementary school ESL teachers, 55 full-time teacher aides, 1 secretary and 1 clerk-typist.

TABLE 4

HISD BILINGUAL EDUCATION PERSONNEL AND COSTS

Location	Position	Individual (Dept.)		Funding	Pay Scale
Central Office Staff	1 Dept. Director	Ms. Rios	(Bil Dept)	HISD 04*	14
	1 Asst. Director	Ms. Gallo	(Staff Dev)	HISD 04*	10B
	1 Asst. Director	Ms. Cordova	(Staff Dev)	HISD 04*	10B
	1 Asst. Director	Vacant		HISD 04*	10B
	1 Materials Sp.	Ms. Suarez	(Bil Dept)	HISD 04*	Teacher +100
	1 Coor ESL Sec School	Ms. Uzell	(Bil Dept)	HISD 04	Teacher + 100
	1 Coor ESL Ele School	Ms. Escobar	(Bil Dept)	HISD 04	Teacher + 100
	1 Secretary		(Bil Dept)	HISD 04*	2B
	1 Clerk Typist		(Bil Dept)	HISD 04*	2A
	1 AV Specialist	Mr. Lillie	(Staff Dev)	Federal 50	Teacher + 100
	1 AV Specialist	Ms. Wilson	(Staff Dev)	"	Teacher + 100
	1 Curr Writer	Ms. Romero	(Soc Studies)	"	Teacher + 100
	1 Curr Writer	Ms. Vera	(Soc Studies)	"	Teacher + 100
	1 Evaluator	Dr. Goodrick	(PPRE)	"	10B
	½ Programmer	Mr. Miller	(PPRE)	"	CS21

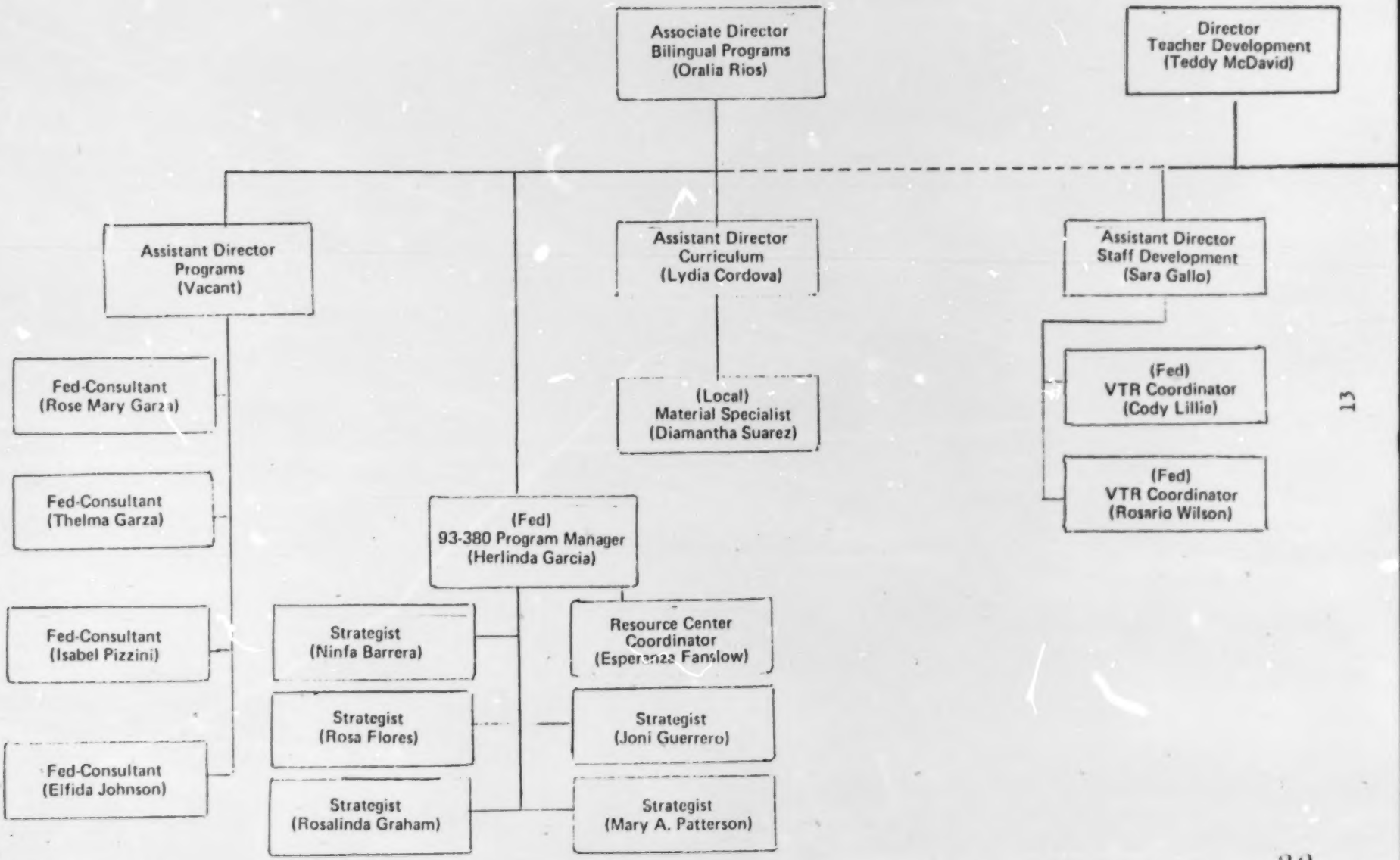
Location	Position	Individual (Dept.)		Funding	Pay Scale
Central Office Staff	1 Secretary		(Bil Dept)	Federal 50	2B
	1 Clerk Typist		(Soc Studies)	"	2A
Area Offices	None				
	1 Program Admin	Ms. Garcia	(Bil Dept)	"	10B
	1 Teacher Strat	Ms. Barrera	(Bil Dept)	"	Teacher + 100
	1 "	Ms. Flores	(Bil Dept)	"	"
	1 "	Ms. Graham	(Bil Dept)	"	"
	1 "	Ms. Guerrero	(Bil Dept)	"	"
	1 "	Ms. Patterson	(Bil Dept)	"	"
Schools	1 Resource Ctr. Coor.	Ms. Fanslow	(Bil Dept)	"	Teacher + 100
	1 Instru. Consultant	Ms. Garza	(Bil Dept)	"	"
	1 "	Ms. Garza	(Bil Dept)	"	"
	1 "	Ms. Pizzini	(Bil Dept)	"	"
	1 "	Ms. Johnson	(Bil Dept)	"	

Location	Position	Individual (Dept.)		Funding	Pay Scale
	1 Clerk Typist	Ms. Cruz	(Bil Dept)	Federal 50	2A
	1 Clerk Typist	Ms. Olivarez	(Bil Dept)	Federal 50	2A
	12 Full-Time Teacher Aides		(Bil Dept)	Federal 50	Aide II
Schools	20 Half-Time Teacher Aides		(Bil Dept)	Federal 50	Aide II
	1 Counselor		(Bil Dept)	HISD 04	Grade 10
	13 Sec ESL Teacher		(Bil Dept)	HISD 04	Teacher
	28 Ele ESL Teachers		(Bil Dept)	HISD 04	Teacher
	285 Bilingual Teachers		(Bil Dept)	HISD E1-6	Teacher
	55 Full-Time Teacher Aides		(Bil Dept)	HISD 04*	Aide II
	ADDITIONAL PERSONNEL NEEDED				
Central Office	None				
Area Offices	6 Bilingual Instructional Specialists (1 per area)			HISD 04*	10A
Schools	3 Consultants (Instructional Coordinators)			HISD 04*	Teacher + 100
	113 Bilingual Teachers			HISD E1-6	Teacher
	115 Teacher Aides			HISD 04*	Aide II

*An asterick indicates locally and state funded personnel charged to the bilingual education budget for bilingual education programs in K-5.

Figure 1

Bilingual Education Personnel



Bilingual education project 50

Project 50 is a federally funded program (P. L. 93-380 Bilingual Education ESEA Title I (VII)) with a total add-on cost of approximately $62 per pupil (HISD 1976-77 Proposed Budget). It provides LESA students with a bilingual education program in grades K-6. It includes components for (a) teacher training, (b) aide training, (c) developing model bilingual programs, (d) supplying materials, and (e) the establishment of a student achievement data bank. This program serves approximately 9,000 students in 73 schools.

As can be seen in Table 4, project 50 authorizes the following personnel for the 1976-77 school year: 1 program administrator, 5 teacher stratetgists, 1 resource center coordinator, 4 instructional coordinators, 1 program evaluator, 1 half-time systems programmer, 3 secretaries, 1 clerk-typist, 12 full-time teacher aides, and 20 half-time teacher aides.

Although the detailed budget projections (HISD Proposed Budget 1976-77) for projects 04 and 50 may be used to estimate the cost of resources for bilingual education, the per pupil costs of these programs are meaningless. This is the case because (a) project 04 considers both ESL and bilingual education programs, (b) both projects include some expenses not necessary for bilingual educaton programs per se (e.g., evaluation component of federal program,) (c) the cost projections are somewhat inaccurate, and most importantly, (d) most of the students in bilingual education programs receive services from both projects.

Organization and personnel

Figure 1 presents an organization chart of most of the individuals directly involved in HISD's bilingual education program.[3] The director of the bilingual department supervises two of three Assistant Directors and the Program Manager

[3]English-as-a-Second-Language (ESL) programs are not considered here, since technically they are not bilingual education programs and apparently do not satisfy the requirements of the Lau vs Nichols court decision (see Task Force Findings Specifying Remedies Available for Eliminating Past Educational Practices Ruled Unlawful under Lau vs Nichols).

for the federally funded (Title I, VII 93-380) bilingual education program. One assistant director is primarily concerned with staff development activities and reports to the Director for Teacher Development of the Staff Development Department. One assistant director is primarily concerned with curriculum and reports to the director of the bilingual department. The third assistant director position is primarily concerned with the ESL and bilingual education programs and reports to the director of the bilingual department. This position is vacant.

Under the assistant director for staff development are two federally funded audio-visual specialists who work on staff development training materials. Under the assistant director for curriculum is a materials specialist who collects and prepares materials for bilingual and ESL programs. Under the assistant director for programs are four federally funded consultants. Each consultant works with the staff of approximately fifteen schools to implement bilingual education programs by providing materials and staff development. The consultants also serve as a liason between the central office, area and school officials in implementing the bilingual education programs. Each strategist under the program manager for the federally funded bilingual education program serves approximately seven classes (K-6) in one school. Their functions are similar to those of the consultants but they work more closely with the teachers in implementing bilingual education programs and are less involved with the central and area office administration.

Cost of Current HISD Bilingual Education Programs

The estimated cost of current HISD Transitional/Bilingual/Multicultural programs for LESA students in grades K through 5 is presented here. It does not include the costs of personnel for ESL programs, bilingual education programs in grades 6 through 12, or the costs of federally funded resources.

Staff

The current cost of administrative and support personnel for bilingual education (indicated by an asterick in Table 4) that are paid from local and state funds is $182,794. The cost of the 216 bilingual education teachers in HISD is not considered as a cost of bilingual education that would exist as an addition to the regular education program. The cost of 50 teacher aides, however, is considered an extra cost necessary to have a bilingual program. The current cost of these teacher

aides is approximately $275,000 ($550 per month X 10 month X 50 aides.) Approximately 6,161 students are served in these programs. Thus the current additional per pupil cost of personnel is ($457,794/6161 =) approximately $74.

As can be seen in Table 4, the cost for administrative and support personnel is greatly decreased by the personnel funded federally.

Materials

For the 1976-77 school year $25 per students was received in state funds for instructional materials. For 6161 students this is $154,025. Approximately $10,000 of these funds were spent for testing. This left $144,025 for instructional materials. An additional $5,000 in office supplies were used by the administrative and support personnel. Approximately half of this amount may be considered an expense necessary for implementing bilingual education programs in grades K through 5. Thus $146,525 or $23.78 per student in materials were used.

Equipment

For the 1976-77 school year, $10,000 was spent for audio-visual equipment

Library

No costs are listed for library materials in the 1976-77 bilingual education budget.

Testing

Ten thousand dollars were spent for testing in the 1976-77 school year.

Inservice Training

Although inservice training and staff development are not categories listed in the project budget, approximately $26,208 was spent in 1976-77 for 58 bilingual teachers to receive training at the University of Houston and for 158 individuals to attend three inservice training sessions.

In summary, $182,794 was spent for administrative and support personnel; $275,000 was spent for teacher aides; $146,525 was spent for materials; $10,000 was spent for audio-visual equipment; no additional funds were spent for library

materials; $10,000 was spent for testing; and $26,208 was spent for inservice training and staff development. The total cost of these resources was $650,527. For 216 bilingual education classrooms and 6,161 students, the per pupil cost was approximately $105.59.

V. Estimated Additional Per Pupil Costs for Minimally Adequate Transitional/Bilingual/Multicultural Programs

Additional Resources for Current Bilingual Educatic.1 Programs

Not all LESA students in HISD are enrolled in Minimally Adequate Transitional/ Bilingual/Multicultural programs as mandated by current state law. The 1976-77 report to the Texas Education Agency reported 10,135 LESA students in HISD in grades K through 5. Approximately 6161 students were enrolled in bilingual education programs in 1976-77. In addition, although about 95% of all LESA students are Hispanic (TEA report 1976-77), approximately 4.7% have a primary language other than Spanish. A number of these students are oriental students (Vietnamese, Cambodian, Laotian) and are receiving services partially funded by the Indochinese Refugee Assistance Program (Texas Outlook, June 1977, p. 24). To meet the requirements of current state law, bilingual education programs need to be made available to more students in HISD.

Staff[4]

In addition to the currently authorized personnel, three extra consultants and six extra bilingual instruction specialists are needed. The consultants would work with principals and teachers by providing staff development and materials to implement bilingual education programs. The bilingual instruction specialists would work with the area administrators to integrate the bilingual education programs into the regular education programs.

[4]Approximately 6161 LESA students in grades K though 5 in 216 classroms received bilingual education programs in 1976-77. (There were more than 216 bilingual teachers employed in 1976-77, however, many students in these classes were not designated as LESA students). This is a student teacher ratio of 28.5 to 1. Although more students need bilingual education programs, approximately 9377 students in 329 classrooms are expected to receive services in 1977-78. These personnel and cost estimates are based on an expected enrollment of 9377 students in 329 classrooms in 1977-78 in current dollar costs.

In addition, 113 extra bilingual teachers (nct charged to the bilingual education budget) and 115 extra bilingual teacher aides are needed to serve approximately 9,377 students in 329 classrooms in 1977-78. Additional personnel are needed for bilingual education programs in grades 6 to 12 and for ESL programs. These personnel are not considered in this analysis.

The cost of three consultants (teacher plus 100) is approximately $41,234; six bilingual instructional specialists (10A pay scale) is $96,000; and 115 extra teacher aides ($5,500 per year) is $632,500. Thus, additional staff will cost approximately $769,734. (See Tables 4 and 5).

Materials

No additional materials are needed.

Equipment

One language master and listening post kit per classroom is needed. Estimating 329 classrooms for 1977-78 and approximately 61 language masters available, an additional 268 language masters and 329 listening posts are needed. At $160 per language master and $50 per listening post, this would be $59,330. In addition, one tape recorder and one record player is needed for every two classrooms. This would be 114 tape recorders and 114 record players. At $69 per tape recorder and $104 per record player, this would be $19,722. Thus, $79,052 in additional equipment is needed.

Library

Every school with enough LESA students to offer bilingual instruction should have books available in the students' primary language. The per pupil cost of library books in the elementary grades in HISD is approximately $6. Given 9377 LESA students to be served in 1977-78, an estimated $56,262 in library materials is needed.[5]

[5] This is based on the assumption that virtually no library materials for LESA students are available to students not enrolled in the five model bilingual school programs.

Testing

Testing needed for LESA students includes initial screening, yearly pretests and posttest of English language proficiency, and yearly pretest and posttest of academic achievement in both the students' primary language and, if appropriate, in English.

The 1976-77 report to TEA reported 10,135 LESA students in HISD in grades K through 5. Assuming that three times this number of students would need to be screened, that is 30,405 students, at an average cost of $1 per student, approximately 30,405 would be needed for screening during 1977-78. Less money would be needed for screening in future years to screen new students who were referred for screening.

Assuming that half the number of students screened, that is 15,203 students, would be referred tor a language proficiency pretest and that such testing cost $6 per student, approximately $91,218 would be needed for pretesting with a language proficiency instrument. Assuming that 10,135 of these students were selected for bilingual education programs, and that these students were retested at the end of the school year, this would be an additional $60,810. Thus, the cost of language proficiency testing woud be $152,028.

Assuming that the 10,135 students eligible for bilingual education programs were administered a pretest and posttest of academic achievement by their teachers at an average cost of $1 per student per test session, $20,270 would be needed for academic testing.

In short, to screen 30,405 students, give 15,203 students a pretest of language proficiency, give 10,135 a posttest of language proficiency, and give 10,135 students a pretest and posttest of academic achievement would cost approximately $202,703.

Inservice Training

Inservice training of bilingual education personnel is needed, but this could be covered by regular authorized inservice training funds. However, a large percentage of currently employed bilingual education teachers and aides are not considered to have a satisfactory knowledge of tne LESA students' language and bilingual education. These teachers and aides will need additional staff development training during the summer and/or throughout the school year.

The per teacher cost of a three-week summer training program for bilingual teachers is estimated to be approximately $869.[6] For one-third of the 329 bilingual teachers expected for the 1977-78 school year, this would cost $95,625. The per teacher aide cost of a two-day preservice workshop for teacher aides is approximately $85 .[7] For fifty percent of the 165 aides expected for the 1977-78 school year, this would cost $7,000. Thus, $102,625 is needed for staff development.

In summary, an additional $755,800 is needed for personnel; no additional funds are needed for materials; an additional $69,052 is needed for audiovisual equipment; an additional $56,262 is needed for library materials; and additional $192,703 is needed for testing; and an additional $76,417 funds are needed for staff development. A total of $1,150,234 in additional funds is needed to provide bilingual education classes for 9377 students. As can be seen in Table 5, a total of $1,800,761 is needed, or approximately $200 per student.

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[6] This is based on ($55 stipend per teacher per day X 15 days X110 teachers) plus ($65 per trainer per day X 15 days X 5 trainers) equals $95,625 or $869.32 per teacher.

[7] This is based on ($30 stipend per aide per day X 2 days X 82 aides) plus ($65 per trainer per day X 2 days X 16 trainers) equals $7,000 or $85.37 per aide.

TABLE 5

Costs of Resources for Transitional/Bilingual/Multicultural Programs in K-5*

Resources		Current Expenditures 1976-77	Per Pupil Cost	Extra Funds Needed 1977-78	Per Pupil Cost of Current and Needed Resources
1.	Staff				
	- Support	182,794		-137,234	
	- Teacher Aides	275,000		-632,500	
	- Total	457,794	74.31	769,734	130.90
2.	Materials	146,525	23.78	0	23.78
3.	Equipment	10,000	1.62	69,052	8.43
4.	Library	0	0.00	56,262	6.00
5.	Testing	10,000	1.62	192,703	20.00+
6.	Inservice Training & Staff Development	26,208	4.25	76,417	10.94
	TOTAL	650,527	105.59	1,164,168	200.06

*The per pupil cost estimates in column two are based on resources available to serve 6161 students in 216 bilingual classrooms in 1976-77. The per pupil cost estimates in column four are based on the resources needed to improve and expand the bilingual education programs to serve 9377 students in 329 classrooms in 1977-78.

+The cost of screening 30,405 students, pretesting of language proficiency for 15,203 students, language proficiency posttesting of 10,135 students, and pretesting and posttesting the academic achievement of 10,135 students is $202,703, or $20 per 10,135 students considered for bilingual education. Considering only students who would actually receive bilingual education programs, the cost would be $15 per student. See text for explanation.

Limitations of Cost Estimates

The purpose of this report is to provide information useful for planning at the local and state level to meet the educational needs of LESA students. This report is useful for this purpose but limited in several ways. One major set of problems involves the budgeting categories to be used and decisions regarding whether a resource is necessary for a minimally adequate transitional/bilingual/education program that is not necessary for the regular education program. Further consideration needs to be given to the budgeting system that best facilitates planning efforts at the local and state level, and yet is compatible with the existing school finance and budgeting procedures. A related limitation of the report is that weighted pupil factors comparing the funds needed with the funds available from the Foundation School Fund have not been calculated. Another limitation of this report is that the cost analysis is projected for only one year, and the per pupil cost of some resources (e.g., equipment) would decrease over a five-year period. On the other hand, this report considers resources which will be necessary (e.g., extensive staff development by local education agency) to implement bilingual education programs which hypothetically would not be required.

VI. Relationship of Educational Needs Projection Model and Bilingual Education Cost Analyses

The purpose of the Educational Needs Projection (ENP) Model project is to develop procedures for forecasting the personnel needs of the Houston ISD over a five-year period in response to current and expected legislation, changing student population, etc. During the first project year, 1976-77, the emphasis is on forecasting the personnel needs for bilingual education programs.

As currently conceptualized, the ENP model for forecasting personnel needs is based on the use of student/teacher ratios, estimates of the number of students in the category to be served, and investigation of variables which influence these two factors (see appendix: Initial Conceptualization of ENP Model). This report on HISD Bilingaul Education Cost Analyses attempts to estimate the personnel and costs of a minimally adequate Transitional/Bilingual/Multicultural program in grades K through 5 in HISD. The per pupil cost estimated in this report can be adjusted to reflect changes in such variables as student/teacher ratios.

It can be expected that the number of HISD students enrolled in bilingual education programs will increase, that bilingual education programs will be extended to students above the fifth grade, that the number of LESA students in the district will continue to increase, and that the actual student/teacher radio (estimated at 28.5/1 in this report) will decrease. Information on each of these expectations and the cost of resources necessary for bilingual education programs will be incorporated in the ENP models as they are developed to produce forecasts of personnel needs and costs.

REFERENCES

Alston, H. L. Initial Conceptualization of ENP Model(s), 1977.

Cardenas, J. A., Bernal, J. J., & Kean, W. Bilingual Education Cost Analysis. San Antonio: IDRA, 1976 a.

Cardenas, J. A., Bernal, J. J., & Kean, W. Bilingual Education Cost Analysis: A Summary. San Antonio: IDRA, 1976 b.

HISD 1976-77 Proposed Budget.

HISD Report to TEA on Number of LESA Students in HISD.

Making the Adjustment, Texas Outlook, June, 1977.

Task Force Findings Specifying Remedies Available for Eliminating Past Educational Practices Ruled Unlawful under Lau vs Nichols. Office of Civil Rights, 1975.

APPENDICES

Comparison of Cardenas et al. and HISD Bilingual Education Cost Analyses

The cost estimates of the Cardenas et al. and the HISD bilingual education studies differ considerably. It is important in both studies to pay attention to the assumptions on which the cost estimates are made and the specific costs that are considered a part of the bilingual education program. To facilitate the use of these cost estimate studies, a comparison is made in this section of the resources considered needed in each area. The per pupil cost estimates are presented in Tables 1 and 5.

Staff

Both studies include one teacher aide for every two bilingual teachers. The Cardenas study, however, uses a lower student/teacher ratio to determine the number of teachers needed.[8] The Cardenas study did not include cost estimates for administrative support personnel. The HISD study estimated the cost of administrative and support personnel needed (see Table 4) to be $320,028. This was approximately 17% of the total add-on cost of a bilingual education program in kindergarten though the 5th grade.[9]

Equipment

The equipment needs cited by the two studies were similar. The Cardenas study recommended two language masters per classroom in grades K-3 and one per classroom in grades 4-5. The HISD study recommended one language master and listening post per bilingual classroom in grades K-5, and one record player and one tape recorder for every two classrooms.

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[8] The Cardenas et al. study used student/teacher ratios of 19/1 ADA in K-3 and 21/1 ADA in grades 4-5. The HISD study used a student/teacher ratio of 28.5/1 in student enrollment per class.

[9] Two things should be noted here. First, the administrative and support personnel necessary for a bilingual education program is not directly proportional to the number of students to be served. The same number of personnel may serve a widely varying number of students. Second, the large size of the Houston ISD makes it desirable for each of the six geographic areas to have a Bilingual Instructional Specialist that might not be necessary in a smaller district. On the other hand, the Houston ISD receives a large amount of personnel support with federal funds that a smaller school district might not be able to receive.

Testing

The Cardenas study included the cost of a language proficiency test on a pretest-posttest basis and an achievement test once-a-year. The HISD study included these tests plus administering the achievement test on a pretest-posttest basis, and the screening of a large sample of referred students.

Library Need

The Cardenas study estimated library costs at $25 per student for the first year of the program and $9 per student in subsequent years. The HISD study estimated library costs at $6 per student per year.

Inservice Training

The Cardenas study considered inservice training as a regular education expense, rather than an expense to be charged to bilingual education, and did not consider the need for staff development. The HISD study included the cost for staff development. As a rough estimate, 33% of all bilingual teachers would need three weeks of staff development per year and 50% of all teacher aides would need two days of preservice training.

The average costs per student per resource area are presented in Table 1 below. Although the total overall cost per pupil is similar, the two cost analyses are quite dissimilar in the resources they consider. Planning to meet the needs of LESA students should take the cost of the particular resources cited into account.

Table 1

Comparison of Cardenas and Alston Bilingual Education Cost Analyses

Resource	Cardenas Estimate of Per Pupil Cost	Alston Estimate of Per Pupil Cost
Staff	$155.70	$130.90
Materials	20.38	23.78
Equipment	8.56	8.43
Library	13.00	6.00
Testing	1.84	20.00
Inservice Training	0.00	10.94
TOTAL	199.48	200.06

Initial ENP Model(s)

The development of an ENP model involves the conceptualization of what purposes (questions) the models are designed to address, what information is needed, the procedures for making estimates given the information, and procedures for obtaining information in an appropriate form.

The ENP model is designed to address personnel needs. It was generally understood that the emphasis would be on teaching personnel rather than other categories of personnel. Nonetheless, it is necessary to begin by asking in what category or categories of personnel needs need to be estimated. In the area of bilingual education, we do want to estimate number of teachers needed. However, budget estimates for bilingual education programs generally do not include teacher salaries. Budget estimates for bilingual education programs at the state level emphasize teacher aides as a personnel cost (e.g., Cardenas et al., 1976) and budget estimates at the local level emphasize non-teaching support personnel (e.g., Bilingual Education Projects 04 and 50, HISD Proposed Budget 1976-77).

In determining the personnel resources needed for a hypothetical program, one may seek expert opinions (Cardenas et al., 1976) or if a similar program exists, one may use the actual personnel and costs of that program and expert opinion to estimate personnel needs and costs (Alston, Initial Estimates of Personnel Needed and Costs of HISD Bilingual Education Programs, 1977). In estimating the personnel needs and costs of a bilingual education program for HISD, estimates are needed for teachers, teacher aides, administrative and support personnel (Alston, Initial Estimates of Personnel and Costs of HISD Bilingual Education Programs, 1977).

The initial ENP model for forecasting teacher personnel needs involves determining the number of students to be served by the category of teacher (e.g., the number of Limited-English-Speaking-Ability (LESA) students) and the student/teacher ratio required (see Figure 1). By multiplying the number of students to be served by the student/teacher ratio, the number of teachers needed is estimated. Given the number of teachers certified to teach in the area (e.g., bilingual education), one may estimate the number of additional teachers needed.

These simple procedures, however, do not constitute the model for estimating teaching personnel needs. Several other components are involved. One component involves obtaining information on current and expected legislation and court decisions and noting how such information may affect the student population served (e.g., extension of bilingual

education mandate to all LESA students) and/or the student/teacher ratios (e.g., Brown report to Texas House of Representatives - Texas Outlook November, 1976, p. 23).

Another component involves estimating changes in the student population due to migration in and out of the district.

Another component involves estimating the available supply of teaching personnel with appropriate certification and/or qualifications.

In reference to predicting changes in the number of students to be served and changes in student/teacher ratios as the result of legislation and court decisions, a number of problems are addressed. One is monitoring current and expected legislation and court cases (see note 2: Urbina & Alston, Current HISD Procedures for Monitoring Education Legislation, 1976; and Note 3: Flores, Review of Legislation and Court Decisions Affecting Bilingual Education, 1976.) A second is predicting educational legislation by identifying and surveying those groups who are most influential in determing public school legislation and policy (see Objectives I and II of 1977-78 ENP Model proposal). A third is determining sampling procedures for estimating the number of students to be served (see memo to Dr. Say dated February 2, 1977, on Sampling Procedures for Determining the number of LESA students in K-3). A fourth is the design and production of appropriate data collection instruments (Language Resource Questionnaires have been developed in both English and Spanish for use in determining the number of LESA students in HISD; also note, Survey of Limited-English-Speaking persons from Non-English-Dominant Environments, Projects, Products, and Services of the National Center for Education Statistics, 1976, p. 112). And a fifth is procedures for validating and revising data collection instruments.

In reference to estimating the available supply of teaching personnel, several approaches may be utilized. Local surveys may be made. Federal studies may be used (Study of Bilingual Education Programs in Institutions of Higher Education, Projects, Products, and Services of the National Center for Education Statistics, 1976, p. 114) and/or sophisticated personnel programs that make use of historical data on teacher turnover rates, etc., may be developed (see Davis & Dunklau, Faculty Projection Program, Dallas ISD, 1976).

In reference to estimating student population in and out of the district, previous studies may be used (e.g., Houston Community Study, 1976), student enrollment and transfer data over the last few years may be analyzed, and/or sophisticated enrollment projection programs may be developed (see Gattis & Dunklau, Enrollment and Facilities Projection Program, Dallas ISD, 1976).

In addition to these components and subproblems, an Educational Needs Projection Model should take into account the desires and expectations of different parent groups of the school system. The desires and expectations of each linguistic/ethnic/economic group should be assessed. This is to say that the program planning conducted on the basis of information and forecasts made by an ENP model should include information on the educational programs and services the parents of HISD students want for their children (e.g., program planning items included in Language Resource Questionnaire for Parents of HISD Students; and Objective III of 1977-78 ENP Model proposal).

In conclusion, this paper described an initial conceptualiztion of an ENP model for predicting personnel needs that attempts to set up procedures for obtaining and utilizing information on current and expected legislation, changes in student population, available teacher supply, etc. Additional work is needed in the development of these models to determine which qualifiable variables will be most useful in making forecasts of personnel needs, costs, etc; to determine the most appropriate procedures for obtaining information on the variables identified; and to develop more sophisticated forecasting models (e.g., the planning models developed by Dallas ISD).

Figure 1

Initial ENP Model (s)

"a"		"b"		"c"
No. of Students in Category to be served	X	Student Teacher Ratio		No. of Teachers Needed for Program
"c"		"d"		"e"
No. of Teachers Needed	-	No. of HISD teachers with appropriate skills	=	No. of Teachers Needed

Figure 1 (continued)

Information on current and expected legislation, etc. that may affect "a", "b", and "d" and consequently "c" and "e".

- HISD Legislative Task Force
- literary reviews
- Texas Legislative Services
- legal staffs reports
- reports from legislators
- reports from members of educational organizations
- questionnaire construction, survey design and sampling plan, validation of questionnaire
- identification and surveying of educational policy making groups

Estimating student population "a" by reference to migration in and out of the district.

- previous studies
- student enrollment and transfer data
- student enrollment projection programs

Estimating available supply of teaching personnel "d".

- local personnel records
- local survey
- federal studies of teaching personnel available

Parental expectations and desires affect "a".

- questionnaire construction
- survey design and sampling plan
- validation of questionnaire

REFERENCES

Adkinson, W. D., and Bishop, T. L. Financial Projection Program: General Description and Users Guide, Dallas ISD, 1975.

Davis, J. D. III, and Dunklau, M. M. Faculty Projection Program: General Description and Users Guide, Dallas ISD, 1975.

Gattis,W. D., and Dunklau, M. M. Enrollment and Facilities Projection Program; General - Description and Users Guide, Dallas ISD, 1975.

Haggart, S. A. (ed.) Program Budgeting for School District Planning, Educational Technology Publications, Englewood Cliffs, New Jersey, 1972.

Johnstone, J. N., Mathematical models developed for use in educational planning: A review. Review of Educational Research, 1974, 44(2), 177-201.

Other possible references include:

Armitage, P. H., Smith, C. S. and Alper, P. Decision Models for Educational Planning. Penguin Press, 1969.

Bartholomew, D. J. Stochastic Models for Social Processes, 2nd Ed., Wiley, 1973.